Amendment
Serial No. 10/716,653

REMARKS

Claims 1-12 are pending. Claims 13-17 are added. Claim 1-7, 9, and 10 stand rejected. Claim 1 is an independent claim.

Claim 13-17 are added. Claims 13-16 is supported by FIG. 3 and 4. Claim 17 is supported by FIG. 3 and 4, and by the specification, at page 11, line 15-19.

Claims 1 and 6 have been amended to conform the claims to the idiomatic English.

The preambles of claims 3-12 have been amended to conform to that of claim 1.

Claim 12 has been amended to remove an inadvertent, typographical error.

The Applicant wishes to thank the Examiner for indicating that claims 8, 11, and 12 would be allowable if the claims are rewritten as independent claims incorporating all features of the base and any intervening claims.

The Applicant, however, wishes to defer rewriting any one of the claims 8, 11, and 12. The Applicant, instead, wishes to amend claim 1, as noted below.

Claim 1 stands rejected under 35 U.S.C §102(e) as allegedly being anticipated by Kish, Jr. *et al.* (U.S. Pub. 2005/0018720) ("Kish").

Claim 1 recites a semiconductor optical transmitter comprising "a first **bidirectional** optical attenuator **interposed between the first active layer and the second active layer**."

As noted in the present specification, at page 9, line 15-17, the first optical attenuator "attenuates light [input] from an active layer located at one side and output the attenuated light to [another] active layer located at the other side" (page 11, line 3-6). For example, the first optical attenuator attenuates the intensity of the light input from the distributed feedback laser diode (the "DFB LD") (id., at line 15-16). In addition, the first optical attenuator attenuates the intensity of the ASE generated from the semiconductor optical amplifier (id., at line 8-10).

As such, the first optical attenuator is a bidirectional attenuator.

According to the United States Court of Appeals for the Federal Circuit, a claim is anticipated only if a single prior art reference **set forth each and every feature** recited in a claim (*Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).

In rejecting claim 1, the Patent Office indicates that Kish sets forth the first bidirectional optical attenuator with its disclosure of PIN photodiode 72 (the "PIN") interposed between a DFB 70 and an EAM (N) 74. In the process, the Patent Office appears to imply that the PIN 74 attenuates light that is input to the PIN 74 by absorbing a portion of the input light in the process of monitoring the intensity of the input light.

Kish, as read by the Applicant, discloses a monolithic In-P based chip 10 comprising a first PIN 68; a DFB 70 adjoined to the first PIN 68; a second PIN 72 adjoined to the DFB 70; and an EAM 74 adjoined to the second PIN 72; and a third PIN 76 adjoined to the EAM 74 (FIG. 4A). According to Kish, the second PIN 72 "monitors the intensity of the DFB laser source 70 output" ([0143]), whereas the third PIN 76 monitors the output of the EAM 74 ([0144]).

However, a PIN photodiode is well known in the art of semiconductor to be inherently unidirectional, that a PIN photodiode absorbs light **unidirectionally** (see Appendix A; see also http://www.rp-photonics.com/p_i_n_photodiodes.html). In particular, the PIN photodiode absorbs light, in the intrinsic region, **entering via one of the doped regions** (id.). The PIN diode does not input light from both n-doped and p-doped regions, and the PIN diode does not absorb light, in the intrinsic region, that enters the diode from both n-doped and p-doped regions (see id. (disclosing that the ring shaped anode and the antireflection coating that allow the light to enter the PIN photodiode are disposed only at one end of the PIN diode)).

Moreover, absence of any teaching that the second PIN 72 monitors the output of the EAM 72 appears to support the notion that the second PIN 72 absorbs only the light output from the DFB 70, hence, absorbs light unidirectionally. Furthermore, Kish's provision of the third PIN 76 to monitor the output of the EAM 74 (1) supports the notion that the second PIN 72 does not absorb light output from the EAM 74 and (2) teaches away from modifying Kish to replace the second PIN 72 with a photodiode that inputs and absorbs light bidirectionally.

As such, Kish fails to anticipate a bidirectional optical attenuator, and Kish fails to anticipate a semiconductor optical transmitter comprising "a first **bidirectional** optical attenuator **interposed between the first active layer and the second active layer**," as recited in claim 1.

The Applicant respectfully requests withdrawal of the rejection.

Other claims in this application are each dependent on the independent claim 1 and believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of the patentability of each on its own merits is respectfully requested.

Should the Examiner deem that there are any issues which may be best resolved by telephone, please contact Applicant's undersigned representative at the number listed below.

Respectfully submitted,

By: Steve Cha
Attorney for Applicant
Registration No. 44,069

Date: January 24, 2007

Mail all correspondence to:
Steve Cha, Registration No. 44,069
Cha & Reiter, LLC
210 Route 4 East, #103
Paramus, NJ 07652
Tel: 201-226-9245
Fax: 201-226-9246

Appendix A

RP Photonics CONSULTING GmbH

part of the Virtual Library

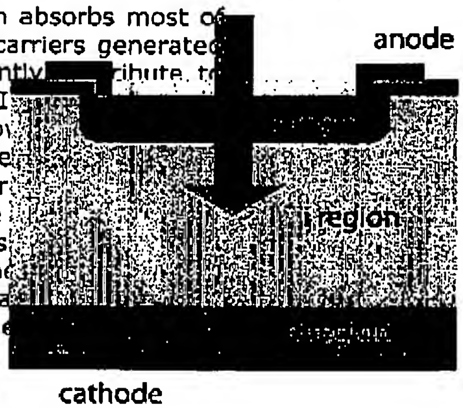
Encyclopedia of Laser Physics and Technology

P-i-n

Definition: photodiodes with a p-i-n semiconductor structure

A p-i-n photodiode (also called PIN photodiode) is a photodiode with an intrinsic (i) (i.e., undoped) region in between the n- and p-doped regions.

The intrinsic region absorbs most of the photons, and carriers generated therein can efficiently ... the photocurrent. I... electrodes are sho... cathode is a flat ele... anode has the for... which two opposite ... the shown cross... positive pole of th... connected to the ca... the p region, the... reflection coating.



Appendix A

cathode

Fig.: Schematic drawing of a p-i-n photodiode.

Compared with an ordinary p-n photodiode, a p-i-n photodiode has a thicker depletion region, which allows a more efficient collection of the carriers and thus a larger quantum efficiency, and also leads to a lower capacitance and thus to higher bandwidth.

The fastest p-i-n photodiodes have bandwidths of the order of tens of GHz. They have rather small active areas (with diameters of a few hundred microns). Some of them are available in fiber-coupled form and can be applied e.g. in optical fiber communications.

See also: photodiodes